

### **REMARKS**

Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-31 are pending in the present application. Claims 1, 17, and 31 are independent claims. Claim 4 is amended by this response.

#### **Examiner Interview**

Applicant's representative spoke with the Examiner regarding this Application on October 8, 2009. During the discussion, Applicant's representative clarified and explained the scope of the claims and the differences between the present invention and the operation of a decision tree. Specifically, Applicant's representative explained that the formation of an intersection set is inconsistent with the nature of decision tree traversal. The Examiner agreed, based on this explanation, that Singh does not suitably teach the present invention as claimed. Applicant now presents written arguments consistent with the discussion of October 8, 2009 and respectfully request either a Notice of Allowance or, if applicable, a new non-final Office Action based on different prior art.

#### **Wrong Claims**

Applicant respectfully notes that, at least with respect to independent claim 17, the Examiner appears to have examined the originally-filed claim and not the claim as amended in the Office Action response of July 25, 2008. Applicant nonetheless offers the following arguments with respect to the references applied by the Examiner in hopes of expediting and advancing prosecution.

### Claim Objections

Claim 4 is objected to as being in improper form because of a multiple dependent claim. Applicant discussed this objection with the Examiner and understand the specific objection to be that claim 4 does not list the multiple claims it depends from in the alternative. Applicant hereby amends claim 4 to recite the multiple claim dependencies in the alternative. Accordingly, reconsideration and withdrawal of this objection is respectfully requested.

### Claim Rejections – Section 102

Claims 1 – 5, 7, 8, 13 – 15, 17 – 23, 25, 26, 28, 29, and 31 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,055,539 to Singh (“Singh”). Insofar as it pertains to the presently pending claims, this rejection is respectfully traversed.

### Prior Art

Singh pertains to a decision tree classifier and a method for generating a decision tree classifier (Abstract). Specifically, Singh, teaches creating decision trees for record classification “by repeatedly splitting the records at each examined node, starting with the root node. At any examined node, a split test is determined to best separate the records at that node by record class” (Col. 3, lines 19 – 22).

As indicated above, the underlying concept of a decision tree is based on differences of sets. Specifically, the aim of a decision tree style classification system is to create a structure where any set of classes at a particular node level in a tree is split among its child nodes in a non-

overlapping fashion, such that each child node contains a subset of the classes contained in its parent node. Each node is therefore a self-contained decision operation whose range of decisions is limited by its parent node and that limits the range of decisions available to its child nodes.

### Claim 1

Independent claim 1 pertains to a record classification method, the method comprising, in pertinent part, “for each record: searching from the selected classification structures a set of suitable classes for each of the specified fields, wherein the suitable classes correspond to a value read from one of said fields, and forming an intersection set of the sets of suitable classes, and selecting a class from the intersection set and assigning the selected class to the record, whereby said assigned class has been read from the field-specifically ordered classification structure.”

A decision tree as disclosed in Singh operates by “splitting the remaining attributes lists of the examined node among its child nodes.” Specifically, in the context of an attribute list, Singh teaches selecting a first field-specific classification structure (a set of attribute lists) and comparing that classification structure to a particular field in a record (the class label field) to determine, based on a calculated or established attribute split, a subset of classes associated with an appropriate child node for further classification. Each child node is a partial field-specific classification structure whose range is already limited by the split indicated by the first classification structure. There is, in a classification decision tree of this type, absolutely no need nor possibility of forming an intersection set between the first and second classification structures because the entirety of the second classification structure is a subclass of the first classification structure.

Specifically, Singh cannot teach or suggest “searching from the selected classification structures a set of suitable classes for each of the specified fields, wherein the suitable classes correspond to a value read from one of said fields, and forming an intersection set of the sets of suitable classes” as required by independent claim 1 because the first split of Singh’s decision tree places a record into one of two (or more) sets of suitable classes based on one particular class identifier in a record. The entire operating paradigm of independent claim 1 is therefore wholly at odds with the conceptual underpinnings of a decision tree.

The fundamental paradigm of decision tree creation is the sequential elimination of possible options through the grouping of those options into progressively narrower sub-sets – each of which may only be chosen once during a tree traversal. This allows for classification by a sequential, increasingly granular analysis where only those portions of a data record relevant to the particular classification operation being performed at a node are examined. This eliminates the need for whole-record analysis at each decision step and instead allows any decision path to be traversed through a number of individual comparisons equal to one minus the number of node layers (so a three-level tree only takes two decision steps).

The identification of multiple sets of suitable options (classes) based on an analysis of a whole record and the subsequent generation of an intersection of suitable classes based on all possible classes that a record could occupy is exactly the sort of operation a decision tree avoids. Each record passed through a decision tree is compared, at each node, against a primary set of suitable classes and classified into one of two or more sub-sets of the primary set (i.e. sent to a child node). Applicant therefore respectfully submits that at least by virtue of its conceptual

foundation, there does not exist any kind of decision tree that will teach or suggest “for each record: searching from the selected classification structures a set of suitable classes for each of the specified fields, wherein the suitable classes correspond to a value read from one of said fields, and forming an intersection set of the sets of suitable classes, and selecting a class from the intersection set and assigning the selected class to the record, whereby said assigned class has been read from the field-specifically ordered classification structure” as required by independent claim 1 because only a single set of suitable classes is selected at any given tree node. A “second” set of suitable classes only exists, in a decision tree, as either a wholly separate class set in a different tree node, or as a subset of the set of classes of the primary node. In either case, the operation of “forming an intersection set of the sets of suitable classes” does not make sense at any tree node as the analysis is based on splitting individual class sets into subsets as opposed to examining the overlap between multiple class sets.

#### Claim 17

As noted above, Applicant respectfully notes that the Examiner cites, in the Office Action, claim language not currently present in independent claim 17. Applicant therefore submits that the rejection of claim 17 is improper as it is not made with respect to the presently pending claim. Applicant specifically notes that the Examiner’s analysis of claim 17 does not refer to the “logic connector,” “reference structure,” or “selection unit” components of claim 17. Accordingly, this rejection is improper and incorrect.

Applicant respectfully submits that insofar as it pertains to the presently pending claim 17, Singh is deficient in its teachings for at least the same reasons as set forth with respect

to independent claim 1. Specifically, the intersection set formation aspect of independent claim 1 is reflected in the “class to structure connector that connects classes suiting each reference value to each ordered structure” of claim 17. Connecting classes suitable for one or more reference values to an ordered structure is similar to creating an intersection set of suitable classes. Applicant therefore respectfully submits that for the same reason that Singh fails to teach forming an intersection set of suitable classes, Singh is deficient in its teaching with respect to claim 17 and all claims depending therefrom.

#### Claim 31

Applicant respectfully submits that independent claim 31 is allowable over Singh for at least the same reasons at set forth with respect to independent claim 1. Specifically, independent claim 31 pertains to a computer-readable medium having embodied thereon a program that, when executed, causes a computer to execute the method of claim 1. Applicant therefore respectfully submits that Singh is deficient with respect to claim 31 for at least the same reasons as set forth with respect to independent claim 1.

#### Dependent Claims

With respect to claims 2 – 5, 7, 8, and 13 – 15, Applicant respectfully submits that these claims are allowable at least by virtue of their dependency from independent claim 1. With respect to claims 18 – 23, 25, 26, 28, and 29, Applicant respectfully submits that the rejection of these claims is improper and incorrect for at least the same reasons at set forth with respect to

independent claim 17. Applicant further submits that these claims are also allowable for the same reasons as set forth above with respect to claim 17.

### Summary

Applicant respectfully submits that Singh is deficient in its teaching and that the present invention's approach to classification based on intersection sets is wholly inconsistent with the fundamental principle of a decision tree as taught by Sing. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

### Claim Rejections – Section 103

Claims 6, 9 – 12, 16, 24, 27, and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Singh in view of U.S. Patent 6,731,730 to Zolotov (“Zolotov”). Insofar as it pertains to the presently pending claims, this rejection is respectfully traversed.

Applicant respectfully submits that claims 6, 9 – 12, 16, 24, 27, and 30 are allowable at least by virtue of their dependency from independent claims 1 and 17. Applicant submits that Zolotov is not relied upon, nor can it properly be relied upon, to remedy the deficiencies of Singh with respect to independent claims 1 and 17. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

**Conclusion**

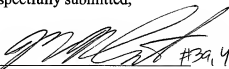
Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but to merely show the state of the art, no comment need be made with respect thereto.

In view of the above amendment, Applicant believes the pending application is in condition for allowance. Thus, the Examiner is respectfully requested to reconsider the outstanding rejections and issue a Notice of Allowance in the present application.

However, should the Examiner believe that any outstanding matters remain in the present application, the Examiner is requested to contact Applicant's representative, Naphtali Matlis (Reg. No. 61,592) at the telephone number of the undersigned in order to discuss the application and expedite prosecution.

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Respectfully submitted,

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